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Übungsaufgaben: Lineare Gleichungssysteme (Teil 1)

Aufgabe 1. Lösen Sie die folgenden linearen Gleichungssysteme:

$a)$ $\begin{aligned} 2x+2y &= 20 \\ 2x-2y &= 4 \end{aligned}$ $b)$ $\begin{aligned} x-y &= 65 \\ 2x+2y &= 214 \end{aligned}$ $c)$ $\begin{aligned} 10x+2y &= 80 \\ 3x+y &= 26 \end{aligned}$

$d)$ $\begin{aligned} 3x+7y &= 60 \\ 2x+18y &= 80 \end{aligned}$ $e)$ $\begin{aligned} 18x-2y &= 12 \\ 3x+\tfrac{1}{3}y &= 10 \end{aligned}$ $f)$ $\begin{aligned} 3x-3y &= 3 \\ 2x-y &= 11 \end{aligned}$

$g)$ $\begin{aligned} 6x+9y &= -42 \\ 2x+4y &= -16 \end{aligned}$ $h)$ $\begin{aligned} 6x+2y &= -10 \\ -x-2y &= -5 \end{aligned}$ $i)$ $\begin{aligned} 4x-2y &= 16 \\ 3x+y &= 17 \end{aligned}$

$j)$ $\begin{aligned} \tfrac{2}{3}x+\tfrac{5}{6}y &= -11 \\ \tfrac{1}{3}x+\tfrac{1}{6}y &= -4 \end{aligned}$ $k)$ $\begin{aligned} 4x+6y &= -36 \\ 3x+2y &= -17 \end{aligned}$ $l)$ $\begin{aligned} 30x-28y &= 100 \\ 5x-2y &= 30 \end{aligned}$

$m)$ $\begin{aligned} 5x-2y &= 27{,}2 \\ 5x-4y &= 20{,}4 \end{aligned}$ $n)$ $\begin{aligned} 5x+8y &= 47 \\ 8x-6y &= 0 \end{aligned}$ $o)$ $\begin{aligned} x &= 3y-2 \\ x &= 5y-12 \end{aligned}$

Aufgabe 2. Lösen Sie die folgenden linearen Gleichungssysteme:

$a)$ $\begin{aligned} 4x &= 6y+2 \\ 6x &= 14y-12 \end{aligned}$ $b)$ $\begin{aligned} 4{,}5x+4y &= 100 \\ 3x-8y &= 10 \end{aligned}$ $c)$ $\begin{aligned} 14x+\tfrac{1}{2}y &= 188 \\ 6x+\tfrac{1}{8}y &= \tfrac{159}{2} \end{aligned}$

$d)$ $\begin{aligned} 11x-2y &= 41 \\ 5x+6y &= 67 \end{aligned}$ $e)$ $\begin{aligned} 15x-7y &= 38 \\ 3x+11y &= 20 \end{aligned}$ $f)$ $\begin{aligned} 2{,}8x+3{,}9y &= 6{,}5 \\ 2{,}1x-2{,}6y &= 1{,}6 \end{aligned}$

$g)$ $\begin{aligned} 1{,}7x-1{,}5y &= 0{,}1 \\ 1{,}3x-y &= 1{,}4 \end{aligned}$ $h)$ $\begin{aligned} 0{,}8x+1{,}3y &= 3{,}9 \\ 1{,}2x+2{,}6y &= 2{,}6 \end{aligned}$ $i)$ $\begin{aligned} 13x-9y &= 2 \\ 23x-15y &= -2 \end{aligned}$

$j)$ $\begin{aligned} 26x-95y &= 9 \\ 13x-57y &= -5 \end{aligned}$ $k)$ $\begin{aligned} 31x-18y &= -5 \\ 53x-24y &= 5 \end{aligned}$ $l)$ $\begin{aligned} 34x+13y &= 5 \\ 51x-4y &= -63 \end{aligned}$

$m)$ $\begin{aligned} 16x+15y &= 1 \\ 24x-3y &= 27 \end{aligned}$ $n)$ $\begin{aligned} 8x+13y &= 5 \\ 2x+7y &= 5 \end{aligned}$ $o)$ $\begin{aligned} 15x+32y &= 190 \\ 6x-12{,}8y &= 76 \end{aligned}$

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Aufgabe 3. Lösen Sie die folgenden linearen Gleichungssysteme:

a)
$$\begin{aligned} 4x - 3y &= 11 \\ 4x + 2y &= 26 \end{aligned}$$

b)
$$\begin{aligned} 612 - 12(3 + 2y) &= 10(7x - 1) \\ 4x + 158 &= 6(9y - 5) \end{aligned}$$

c)
$$\begin{aligned} 5(x - 4) - 2(y + 15) &= -33 \\ 18y + 16x - 6(7y - 1) &= -186 \end{aligned}$$

d)
$$\begin{aligned} 7{,}5x + 10y &= 12{,}5 \\ 8{,}4x + 11{,}2y &= 13{,}6 \end{aligned}$$

e)
$$\begin{aligned} 24x + 40y &= 81 \\ 21x + 35y &= 73 \end{aligned}$$

f)
$$\begin{aligned} 2x + 3y &= 4 \\ 9x + 12y &= 21 \end{aligned}$$

g)
$$\begin{aligned} x + y &= a \\ x - y &= b \end{aligned}$$

h)
$$\begin{aligned} x + y &= 5e + f \\ x - y &= e + 5f \end{aligned}$$

i)
$$\begin{aligned} x + y &= a^2 - b^2 \\ x - y &= (a - b)^2 \end{aligned}$$

j)
$$\begin{aligned} 6x - 2y &= 22 \\ 7y + 5z &= 33 \\ -14x + 16z &= -54 \end{aligned}$$

k)
$$\begin{aligned} 2x + 8y + 14z &= 178 \\ 7x + y + 4z &= 74 \\ 4x + 7y + z &= 77 \end{aligned}$$

l)
$$\begin{aligned} 14x - 6y - 22z &= 76 \\ 18x + 4y - 120z &= 8 \\ 2x - 2y - 2z &= 4 \end{aligned}$$

m)
$$\begin{aligned} 2x + 3y + 4z &= 49 \\ 3x + 4y + 5z &= 64 \\ 4x + 5y + 6z &= 79 \end{aligned}$$

n)
$$\begin{aligned} 6x - 7y + 5z &= 31 \\ 9x + 8y - 13z &= 55 \\ 11x - 5y - 7z &= 23 \end{aligned}$$

o)
$$\begin{aligned} x + y &= 7 \\ y + z &= 14 \\ x + z &= 11 \end{aligned}$$

p)
$$\begin{aligned} x + y &= 28 \\ x + z &= 30 \\ y + z &= 32 \end{aligned}$$

q)
$$\begin{aligned} x - y + 2z &= 6 \\ 2x + 3y + 2z &= 11 \\ 3x + 2y + z &= 8 \end{aligned}$$

r)
$$\begin{aligned} 3x + 6y - 2z &= -4 \\ 3x + 2y + z &= 0 \\ \tfrac{3}{2}x + 5y - 5z &= -9 \end{aligned}$$